Study Of The Effects Of Deficiency Of Nutrients (Vitamins, Minerals) In Fowls (Gallus gallus) Of Poultry Farms In Ajmer.

अजमेर में पोल्ट्रीफार्म की मुर्गियों (गैलस गैलस) में पोषक तत्वों (विटामिन, खनिज पदार्थ) की कमी के प्रभावों का अध्ययन।

SYNOPSIS SUBMITTED FOR THE DEGREE OF

DOCTOR OF PHILOSOPHY (Ph.D.)

IN

SCIENCE

DEPARTMENT OF ZOOLOGY

To

MAHARSHI DAYANAND SARASWATI UNIVERSITY

AJMER

2017

SUBMITTED BY

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Appendix - IV

FORMAT FOR OUTLINE OF PROPOSED RESEARCH WORK

1. **Name of Scholar (In English)** : Dimple Badgotri

   (In Hindi) : डिम्पल बड़गोत्री

2. **Title of the Research work** :

   (In English) : **Study of the effects of deficiency of Nutrients (vitamins, minerals) in fowls (Gallus gallus) of poultry farms in Ajmer.**

   (In Hindi) : **अजमेर में पोल्ट्रीफार्म की मुर्गियों (गैलस गैलस) में पोषक तत्वों (विटामिन, खनिज पदार्थ) की कमी के प्रभावों का अध्ययन।**

3. **Location** :

   (a) Institution / Department where the work is to be done.

   (b) Geographical area of investigation : Ajmer, Rajasthan.

4. Importance of proposed Investigation.

5. Objectives :

6. Review of literature (Review of work already done on the subject of proposed research study)

7. Research gaps identified in the proposed field of investigation.

8. Major Hypothesis

9. Research Methodology

10. References

Outline Approved

Dr. Reena Vyas

Name and signature of supervisor
with date and seal

Dimple 21.11.2021

Signature of Candidate with date

MAHARSHI DAYANAND SARASWATI UNIVERSITY, AJMER

PROPOSED RESEARCH WORK

1. **Name** (In English) : Dimple Badgotri

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3. **Location -**

   a. **Department of Zoology**

      S.P.C. Govt. College, Ajmer (Raj.)

   b. **Geographical area of Investigation :**

      Ajmer Dist. (Raj.)

      Foy Sagar road poultry farms &

      Naka Madar poultry farms

4. Introduction - Importance of Proposed Investigation

Study area for the proposed research work will be Foy Sagar road poultry farms & Naka Madar poultry farms, situated in Ajmer.

The high income yielding occupation of pouLtry farming, confined mostly to big cities so far, has reached small and new village. Poultry farming as a profitable livelihood opportunity was identified by a public service institution **Lupin human welfare & Research foundation**.

Poultry convert feed into food products quickly, efficiently and with relatively low environmental impact compared with other livestock. The high rate of productivity of poultry results in relatively high nutrient needs. Poultry requires the presence of at least 38 dietary nutrients in appropriate concentrations and balance. They are derived from experimentally determined levels after an extensive review of the published data. Criteria used to determine the requirement for a given nutrient include growth, feed efficiency, egg production, prevention of deficiency symptoms and quality of poultry product. These requirements assume that the nutrients are in a high bio-available form and they do not include a margin of safety. Consequently, adjustments should be made based on bio-availability of nutrients in various feedstuffs. A margin of safety should be added based on the length of time. The diet will be stored before feeding, changes in rates of feed intake due to environmental temperature or dietary energy content, genetic strain, husbandry conditions (especially the level of sanitation and proper housing), and the presence of stressor (such as diseases or mycotoxins).

Importance of Proposed Investigation

This study will be helpful to poultry breeders to identify the different deficiency symptoms and also will suggest them to overcome the problems. This kind of research is really needed in this region because poultry is one of the main profitable occupation in Ajmer.

Commonly available feedstuffs are usually deficient in many nutrients and diets must be supplemented with the deficient nutrients, usually from purified sources. Errors in the formulation or milling may sometimes result in deficient or toxic levels of one or more nutrients. Severely deficient or toxic levels often are expressed as characteristic pathologies to organs and tissues. Marginally inadequate supplies often result in suboptimal growth, impaired resistance to infectious diseases, decreased egg production, or lowered hatchability. Frequently, it is the task of the veterinarian to determine whether an ailment is nutritional in its origin or whether nutrition is a contributing factor to a specific clinical problem. It may be difficult to recognize a partial nutritional deficiency because nonspecific signs may be brought about by a number of causes, including infectious diseases and toxicants.

5. Objectives

* Effect/study of essential nutrients deficiency and strategies for enhancement of health of poultry birds.
* Factors affecting growth of poultry birds.
* Effects of toxicity of excessive nutrients like vitamins, minerals on poultry birds.
* Study of non-infectious disease diagnosis, treatment and prevention.

6. Review of literature

Previous work done on the nutritional requirements of Poultry and their deficiency symptoms explains importance of Poultry as food alternatives.

Adamstone and Card (1934) studied the effects of vitamin-E deficiencies on the testis development of the male fowl.

Almquist (1942) studied the significance of Magnesium on the growth of chicks.

Briggs, Grauschke and Lillie (1946) studied the effect of Proteins low in tryptophan on growth of chickens and on laying hens receiving nicotinic acid low rations.

Asmundson and Kratzer (1952) explained the vitamin-A deficiency in turkey breeding stock.

Hill and Matronc (1961) studied on copper and iron deficiencies in growing chickens.

Beer, Scott & Nesheim (1963) studied the effects of graded levels of Panthothenic acid on the breeding performance of white leghorn pullets.

Baker Allen and Kleiss (1973) showed the efficiency of tryptophans as a niacin precursor in the young chick.

Halley *et al* (1987) studied the altering dietary mineral balance on growth, leg abnormalities, and blood base excess in broiler chicks.

Bryden (1991) explained the tissue depletion of Biotin in chickens and the development of deficiency Lesions and the fatty liver and kidney syndrome.

Fuhrmann and Sallmann (2000) studied the Brain, liver and plasma unsaturated aldehydes in nutritional encephalomalacia of chicks.

Jianhua *et al* (2000) observed that Selenium influences growth via thyroid hormone status in broiler chickens.

Jin *et al* (2001) studied the Dietary vitamin K requirement and comparison of biopotency of different vitamin k sources for young turkeys.

Kaya *et al* (2002) studied the Feeding diets supplemented with zinc and vitamin A in laying hens: Effects on histopathological findings and tissue mineral contents.

Lichovnikova *et al* (2003) found the longterm effects of using a higher amount of iodine supplement on the efficiency of laying hens.

Latshaw *et al* (2004) studied the Selenium toxicity in breeding ring-necked pheasants (Phasianus colchicus).

Whitehead *et al* (2004) explained the importance of High vitamin D3 requirements in broilers for bone quality and prevention of tibial dyschondroplasia and interactions with dietary calcium, available phosphorus and vitamin A.

Xiang *et al* (2004) found the Sodium chloride-induced acute and chronic pulmonary hypertension syndrome in broiler chickens.

Yalcin *et al* (2004) studied the Effects of supplementary iodine on the performance and egg traits of laying hens.

Borges *et al* (2004) studied the Physiological responses of Broiler Chickens to heat stress and dietary electrolyte balance (Sodium plus potassium minus chloride, milliequivalents per kilograms)

M. W. Islam[3], M.M. Rahman, S.M. Kabir[2], M.N. Islam[3] (2004) Studied the Effects of probiotics supplementation on growth performance and certain Haemato-Biochemical parameters in Broiler chickens.

Suchint Simaraks, Orawan Chinrasri and Worapol Aengwanich (2004) Explained the Haematological electrolyte and serum biochemical values of the Thai indigenous chickens (Gallus domesticus) in northeasthern Thailand.

M. Asaduzzaman, M.S. Jahan, M.R. Mondol, M.A. Islam and A.K. Sarkar (2005) Studied the Efficacy of different commercial vitamin mineral premixes on productive performance of caged laying pullets.

Kaya *et al* (2006) studied the Effect of copper deficiency on blood lipid profile and haematological parameters in broilers.

P. manoura, M. Rahman[2], M.F.R. Khan[2], M.B. Rahman[2] and M.M. Rahman[2] (2008) Explained the Effect of vitamins, minerals and probiotics on production of antibody and live weight gain following vaccination with BCRDV in broiler.

Ganguly *et al* (2010) studied the Immunostimulant, probiotic and prebiotic – their applications and effectiveness in aquaculture.

Sheikh Adil, Tufail Banday, Gulam Ahmad bhat, masood Saleem mir[2], and Mazoor Rehman[3] (2010) Studied the effect of Dietry supplementation of organic acids on performance Intestinal histomorphology and serum biochemistry of broiler chicken.

Ganguly and Mukhopadhayay (2011) explain the effect of Immunostimulants, Probiotics and Prebiotics.

Das *et al* (2012) found the importance of Mannan oligosaccharide and organic acid salts as dietary supplements for Japanese quail.

7. Research Gaps identified in the proposed field of investigation

No specific work has been carried out regarding nutritional requirements of poultry birds, in Ajmer District including nutritional diseases prevalent in Ajmer region.

8. Major Hypothesis

The quantitative nutrient requirements of the young growing chick and for light breeds of laying hens are quite well established. However, the requirements of growing chicks and birds after the first few weeks of age and the requirements of male and female broiler breeding fowls for many nutrients have not been determined experimentally. Food substances of importance in nutrition of poultry are water, proteins and amino acids, carbohydrates, fats, vitamins, and essential inorganic elements.

9. Research Methodology

I. Regular visits of the poultry farms will be made during the years 2017 - 2018 & 2019 to collect the data and Blood sample collection like breeds of poultry, Growth charts, Diet Charts, Symptoms etc.

II. Regular inspection of poultry birds will be done in the 3 or 4 selected poultry farms in Ajmer region to detect any nutritional diseases/deficiency (including mineral, vitamins) affecting poultry birds by viewing the behaviour and the external symptoms and traits of diseased birds.

III. There are two general sources of information upon which to base a diagnosis of nutritional deficiency. These are.

1. **External symptoms**

A. Size of the poultry farm, No. of birds in each chamber, Type & thickness of litter, Aeriation, Light arrangements etc.

B. There are certain external symptoms which are characteristic in a way of nearly all diseases. These symptom indicate that the bird is sick.

C. When the bird shows such symptoms it should be picked up and isolated and an effort made to obtain a more precise diagnosis.

D. Examination of the diets according to vitamin deficiencies.

E. Examination of Eggs, size, shape, shell etc.

F. Examination of Growth Chart after Adequate diet supply.

G. Examinations of body features to find out the tremors, rapid contractions.

H. Observation of young poultry - usually between 15th and 30th days of life.

I. Observation of the clinical signs of vit - E deficiency like - Subcutaneous oedema, bluish/greenish exudate under the skin.

J. Examination of feathers of young poultry.

K. Observations of diseased poultry birds behaviour.

M. Constituents of feeds will also be observed and Analysed.

2. **Post Mortem examination**

Whenever a bird dies from a cause not entirely clear to the poultry man a post-mortem examination should be made in order to learn, if possible, from the condition of the internal organs. Necessary articles required for the examination are as follows.

I. A good sharp knife with a pointed blade.

II. A pair of bone forceps.

III. A pair of medium sized dissecting scissors.

IV. A wooden table or dissecting board.

V. Microscopic examination of the epithelial-tissues-lesions of dead birds (Diseased or infectious birds will be cut by using dissection technique).

After doing a proper incision from the ventral surface, we can proceed to the examination of the different organs for evidence of the diseases.

Visceral organs - Liver, Heart, Kidney, Lungs, Intestine and some major blood vessels etc. Should be examined carefully.

3. Sanitation, stocking density and hygiene of deep litter poultry farms will be observed and noted down.
4. Water sampling, feed sampling & faeces sampling will be tested with standard technique.
5. Selected poultry birds will be ringed to identify and for testing.
6. The weight of selected poultry birds will be weighed using standard balanced.
7. The age of selected poultry birds will be noted down and their growth will be recorded as well.

IV **Haematology :** Blood will be taken subjected to estimation of haematalogical analysis and biochemical analysis during seasonal interval.

Total of 20 blood samples will be taken from poultry birds from the wing vein using 3 ml disposal syringes and collected with EDTA containing test tube and analysed immediately.

Haematological parameters :

1. Total erythrocyte count (TEC)
2. Haemoglobin (Hb) will be determined by haemocytometer and packed cell volume (PCV)
3. Erythrocyte sedimentation rate (ESR) will be measured by wintrobe haematocrit tube (**Lamberg and Rothstein** 1977)
4. Differential WBC counts (DLC) will be made on monolayer blood films, stained using Giemsa stain after fixing them with methyl alcohol.

Biochemical parameters : Serum biochemical (total cholesterol, Triglycerides, High density Lipoprotein and low denstiy lipoprotein), total protein analysis will be analysed.

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Dimple . 24.11.2021

Signature of the Candidate with date

Outline Approved

Dr. Reena Vyas 24.11.2021

Name and Signature of Supervisor with Date and Seal.

Facilities available for the work.

All the necessary research facilities required for the proposed study are available at the department of Zoology S.P.C. Govt. College, Ajmer.

प्रभारी
प्राणीशास्त्र विभाग,
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Signature

Supervisor/Head Department of Zoology

S.P.C. Govt. College, Ajmer.